



FILED

12-12-14

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Develop a
Successor to Existing Net Energy Metering Tariffs
Pursuant to Public Utilities Code Section 2827.1,
and to Address Other Issues Related to Net
Energy Metering.

Rulemaking 14-07-002
(Filed July 10, 2014)

**ADMINISTRATIVE LAW JUDGE'S RULING ADOPTING
SPECIFICATIONS FOR FURTHER DEVELOPMENT OF PUBLIC TOOL**

Background

As part of the work in this proceeding, Energy Division staff have engaged and worked with consultants on the development of what has come to be called the "public tool" for use in this proceeding. The intent of the Public Tool is to provide a common framework for parties to use in this proceeding to test various options for a successor to existing net energy metering (NEM) tariffs.

Parties have had several opportunities to review and comment on the work in progress on the Public Tool. These include:

- A workshop led by Energy Division staff on April 23, 2014.
- Informal comments provided to Energy Division staff after a staff workshop on April 23, 2014.
- A workshop led by Energy Division staff on August 11, 2014.
- Comments and reply comments filed in response to the Administrative Law Judge's Ruling Seeking Post-Workshop Comments (September 5, 2014).

- A webinar facilitated by consultants on December 2, 2014.

It is anticipated that the further development of the Public Tool will continue to be an iterative process, with additional opportunities for review and comment by parties.

1. Specifications for Public Tool

Although it is intended that a significant amount of flexibility will be built into the Public Tool to allow parties to efficiently model the impact of various rate designs and input assumptions, run custom scenarios, and model user-defined successor tariffs or contracts, users will not have the ability to make changes to the underlying methodologies and logic used in the model. Because some choices will, of necessity, be closed to users, it is desirable to provide a transparent record of the specifications for the Public Tool.

Attachment A to this ruling provides a list of the elements that are adopted and will be incorporated into the draft Public Tool. For the convenience of the parties, Attachment A also provides brief descriptions of some elements identified by parties that will not be incorporated.

2. Scope of this ruling

This ruling adopts the elements in Attachment A as the specifications for the continued development of the Public Tool in this proceeding.

This ruling does not preclude or limit the rights of any party to comment on the continuing development of the Public Tool, or on any aspect of the draft Public Tool when it is released, or on any proposals developed through using the

Public Tool, in accordance with the schedule and instructions that may be set by the presiding officer.

IT IS RULED that:

1. The elements set out in Attachment A to this ruling are adopted as the specifications for the further development of the Public Tool for use in this proceeding.
2. The adoption of these specifications does not preclude or limit the rights of any party to comment on the continuing development of the Public Tool, or on any aspect of the draft Public Tool when it is released, or on any proposals developed through using the Public Tool, in accordance with the schedule and instructions that may be set by the presiding officer.

Dated December 12, 2014 at San Francisco, California.

/s/ ANNE E. SIMON
Anne E. Simon
Administrative Law Judge

ATTACHMENT A

ATTACHMENT A Specifications for Public Tool

Modeling Approach¹

1. Evaluation metrics included in the Public Tool:
 - a. Ratepayer Impact Measure (RIM) test
 - For total generation of the system as well as only exports to the grid
 - b. Participant Cost Test (PCT)
 - c. Program Administrator Cost (PAC) test
 - d. Total Resource Cost (TRC) test and Societal Cost test (SCT)
 - e. Cost of service analysis
 - f. Renewable distributed energy resource (DER) adoption rate (Megawatts (MWs) by system size, technology modeled and customer class).
 - Users will be able to adjust the adoption curve parameters and input specific adoption rates. The adoption module will be calibrated to back-cast historic adoptions
 - g. Renewable DER value proposition (e.g., internal rate of return, payback period (years))
 - h. Greenhouse gas emissions reductions

Cost tests are reported as levelized \$/kWh, annualized \$/year and present value (PV). The net benefit (cost) will be reported on a PV basis. The PV (Cost)/PV (Benefit) ratio will also be reported. DER growth will be reported based on dollars installed, MW installed, and number of systems installed.

1. A. *Evaluation metrics not included in the Public Tool:*
 - 1) A revenue requirement allocation specific to participating customer-generators. However, using the cost causation rate structure, the cost of service for each customer bin will be calculated
 - 2) Percentage of cost of service paid by specific rate components, since all rate designs may not explicitly link cost of service components to specific rate components
 - 3) Following the Distributed Generation (DG) cost-effectiveness methodology adopted in D.09-08-026, the RIM test will not include

¹ For ease of reference, the sections of this attachment roughly follow the order of the topic areas in the Administrative Law Judge's Ruling Seeking Post-Workshop Comments (September 5, 2014).

societal values. Instead, societal values will be included as a user defined input in the total resource cost / societal test.

2. Avoided cost components included in the Public Tool (using the E3 Avoided Cost model with certain simplifications):
 - a. Energy purchases
 - The model will include increased & reduced load policy scenarios due to electric vehicles (EVs) and Zero Net Energy home penetrations
 - Energy price and capacity balance forecasts will reflect the removal of San Onofre Nuclear Generating Station (SONGS) beginning in 2012
 - b. Generation capacity
 - The Public Tool will use the Effective Load Carrying Capacity (ELCC) method to calculate generation capacity. Users will be able to select vintaged or non-vintaged treatment of ELCC to calculate cost-effectiveness for a technology. They will also be able to enter their own estimates of capacity value by technology over time
 - Publicly available estimates of generation capacity costs will be used
 - c. Transmission and distribution (T&D) capacity
 - Investor-owned utility (IOU) T&D capacity costs will be populated in the Public Tool using data from the 2011 E3 study “Technical Potential for Local Distributed Photovoltaics in California” Preliminary Assessment. Users can then select the percentage of those costs to include in their analysis
 - d. California carbon allowances
 - e. Energy and capacity losses
 - Losses are modeled, but losses changes re not. The model will include market heat rates that vary with Renewable Portfolio Standard and other scenarios.
 - f. Ancillary services procurement reduction
 - Ancillary services costs are modeled on an overall revenue requirements level and attributed to avoided costs via a percentage adder
 - g. Renewables Portfolio Standard (RPS) procurement
 - The Tool will include 33%, 40% and 50% RPS scenarios

- The model will continue the RPS cost avoidance methodology used in the recent E3 avoided cost calculators. Renewable Energy Credit (REC) banking and borrowing logic will be included in the Public Tool.
 - NEM tariffs will have a default value of a category 3 REC² set to zero, but users can enter their own estimate. The value of a category 1 REC will be attributed under an export-only FiT where exported energy counts towards a utility's RPS requirements; this will be a user-defined input.
- h. Societal costs will be broken out into the following categories that users can populate (included as a user defined input in the total resource cost / societal test):
- Avoided societal cost of carbon (\$/ton avoided CO₂)
 - Health benefits (\$/kWh avoided thermal generation)
 - Improved energy security (\$/kWh avoided thermal generation)
 - Reduced RPS externalities (\$/kW avoided utility-scale RPS capacity)
 - Other (\$/kWh NEM generation; \$/kW NEM capacity; \$/kWh avoided thermal generation).

2.A. *Avoided cost components not included in the Public Tool:*

- 1) The "avoided cost" of added natural gas capacity
- 2) Social benefits, such as the societal cost of carbon, health benefits, economic development, improved energy security, and reduced RPS externalities will not have a default value but are included as a user defined input.
- 3) Renewable generation-related externalities, such as natural gas price hedges, water costs, and pollution control equipment, are already accounted for in the avoided marginal resource costs, and will not be added as a separate avoided cost component to avoid double counting.
- 4) Avoided land use impacts.

² The portfolio content categories for different types of RPS-eligible procurement are set out in Pub. Util. Code § 399.16. The Commission implemented this statutory arrangement in D.11-12-052. The category designations follow those set in D.11-12-052.

3. Utility and participant DG cost components:
 - a. Renewable power purchase agreement or installed system cost (Participant cost)
 - The Tool will incorporate the ongoing costs of operations, maintenance, and taxes associated with the installed system as participant cost components
 - Includes additional meters (if additional meters are necessary).
 - b. Interconnection cost (Utility cost if exempted; Participant cost if not exempted)
 - c. Billing and metering cost (Utility cost)
 - d. Integration costs, including increased ancillary services costs (Utility cost)

Data Sources

As a general principle, the most accurate and most recent publicly available data will be used. Where customer-specific data is a better or necessary source, the data will be aggregated to protect customer confidentiality. Revenue requirements for each utility will be seeded with default values; certain default values can be modified based on user-determined assumptions. Avoided costs will generally be consistent with these values.

The following data sources, identified in party comments, will also be used in the Public Tool:

- Revenue requirements through 2024 will be calibrated to publicly available sources, including the California Energy Commission's (CEC) Integrated Energy Policy Report (IEPR)³ as well as the most recent IOU General Rate Case (GRC) filings.
- The impact of renewables on hourly market prices will be based on Plexos market simulation analyses performed by the CEC in 2014 for the Title-24 building standards update.
- The resource mix will be modeled using 2014 data from the long-term planning proceeding (LTPP) and 2014 RPS model data.
- Gas prices will reflect the 2013 IEPR forecast.

³ For the 2014 IEPR Report Update, see: http://www.energy.ca.gov/2014_energypolicy/

- The Public Tool will use the 2013 IEPR forecast as the default for California carbon allowance costs.
- Interconnection costs will reflect the 2014 IOU Advice Letter filing data.
- Technology cost data will be based on publicly available sources.

The Public Tool

1. Term of analysis:
 - a. Through 2050, with results reported on annual and lifecycle bases.
 2. Technologies evaluated in the Public Tool:
 - a. Solar photovoltaic (PV)
 - Assumed 25-year life
 - b. Solar PV coupled with energy storage
 - Storage paired with PV will be produced for the following scenarios: maximizing grid benefits; avoiding/minimizing a monthly demand charge; TOU arbitrage for two bookend TOU period specifications.
 - c. Wind
 - d. Biomass
 - e. Biogas-fueled technologies (including fuel cells)
- 2.A. *Technologies not included in the Public Tool:*
- 1) Small hydroelectric and in-conduit hydro projects. Provided the hourly generation shape for small or in-conduit hydro matches the generation shape of one of the technologies included in the tool, users may modify the tool model hydro adoption.
3. Technologies are assumed to be installed with smart inverters that are capable of autonomous power factor deviation from 1.0 (leading/lagging), but are not dispatched or controlled centrally.
 - a. Modeled via increased inverter capital costs, decreased interconnection costs, low distribution incremental costs, and no limits on distribution-level interconnection of solar.
 4. Customer classes to be evaluated in the Public Tool include residential (residential and residential CARE), commercial (small, medium and large), industrial, and agricultural.

4.A. The Public Tool will not model impacts on individual customer types, such as schools, hospitals, or farms. The streetlight class will also not be evaluated for DG adoptions, although they will be included in the revenue requirements model.

5. Zero Net Energy policy scenarios will be included as inputs, with reductions in building energy usage in the forecasts, as well as high levels of solar PV for those buildings.
6. Of the top three user inputs identified by parties, the following inputs will be able to be modified in the Public Tool:
 - a. Resource Balance Year
 - b. T&D capacity costs
 - c. Energy prices (via scenarios and natural gas and carbon prices)
 - d. Selection of a 33%, 40% or 50% RPS scenarios
 - e. DER equipment and installation costs
 - f. Interconnection costs
 - g. Flexible TOU period definitions
 - h. Capacity value
 - i. Ability to scale avoided costs by component
 - j. Societal benefits
 - k. Marginal T&D costs
 - l. Marginal customer costs
 - m. Allocation of generation capacity costs
 - n. Line losses

6.A. The Public Tool will not allow user control of the following inputs:

- a. Operating parameters of combustion turbines (CTs) and combined cycle gas turnbines (CCGTs). Energy and capacity costs can be altered directly, obviating the need to modify these inputs; generation capacity costs will be allocated based on ELCC.
- b. Allocation of T&D costs (T&D costs are a small share of total avoided costs; T&D allocations in the Public Tool will be necessarily generalized).
- c. Marginal heat rates.

Pricing Mechanisms and Rate Designs

1. Participating customer-generators will not be modeled as a separate customer class for cost allocation and rate design purposes.
2. Pricing mechanisms included in the Public Tool:
 - a. Form of compensation: Bill credit or direct compensation (with the ability to model different potential tax implications)
 - b. Pricing
 - Credits based on the underlying retail rate structure
 - Cost-based compensation
 - Flat, escalating, or declining over time
 - Can vary by technology
 - Can be differentiated by class, but not by size
 - Value-based or market-based compensation
 - Can vary by time of use (TOU) period, and be periodically updated over time
 - Can be differentiated by class, but not by size
 - c. Quantity: All generation or net exports (where exports to the grid receive a separate form of compensation)
3. Locational value will be captured via different capacity factors per customer bins. Additional locational value functionality may be provided.
4. Public Tool will calculate energy netting on a half hourly basis.
5. The Public Tool will be able to model one or two rate designs per customer class. This will allow analysis of scenarios where participating customer-generators are on a different rate design than the non-participants, as well as scenarios where participants and non-participants are on the same rate design. The Public Tool will be able to support the following residential rates:
 - a. Residential rate structures include those examined in the Residential Rates OIR and other rates specific to DG:
 - Seasonal TOU with baseline credit
 - Seasonal TOU
 - CPP/PDP
 - 2-tier non-TOU
 - 3-tier non-TOU
 - 4-tier non-TOU

Users will be able to design TOU periods using 8 seasonal weekday blocks: 6am-9am, 9am to noon, noon - 2pm, 2pm-4pm, 4pm-6pm, 6pm-8pm, 8pm-10pm, 10pm to 6am. Tier breaks can be defined by users as combinations of 101%, 131% and 201%. All of these designs can also be layered with a fixed charge. For users that do not wish to modify rate components, users can select a rate design from a drop-down menu that will be pre-seeded with rate component values that collect the revenue requirement.

- b. Users will also have the ability to vary the following charges for participating residential customer-generators:
 - Grid charge
 - Minimum bill and/or fixed monthly charge
 - Demand charge

5.A. Users will not be able to calculate a demand charge by TOU period or include a standby charge for residential customers

6. The Public Tool will support the following non-residential rates:
 - a. TOU periods can be designed from eight TOU blocks per weekday. These eight blocks can be aggregated into TOU periods that should match, within one hour, the current IOU TOU definitions plus all of the TOU recommendations put forth. Weekends will have one TOU period.
 - b. The Tool will allow users to specify rates that include or exclude demand charges (regardless of whether the predominant rate for the class currently has demand charges).
 - c. Fixed monthly charges, standby charges, and the calculation of minimum bills in the determination of participant bill savings can also be incorporated.

Residential Customers in Disadvantaged Communities

At this time the Public Tool will not include alternatives for residential customers in disadvantaged communities. Energy Division staff intends to hold a public workshop to advance the development of options for residential customers in disadvantaged communities. Energy Division staff may propose updates to the Public Tool to incorporate an analysis of options for residential customers in disadvantaged communities options at a later date, or develop the appropriate analytic tools outside the framework of the Public Tool.

NEM Aggregation

Data are insufficient to be able to evaluate the costs and benefits of NEM Aggregation (NEMA) in the Public Tool. Users will be able to estimate the impact of NEMA by using a capital cost reflective of a large solar system, to the extent that the agricultural customer "bin" data can represent the usage of aggregate smaller accounts.

(END OF ATTACHMENT A)